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MORGAN, LEWIS & BOCKIUS, LLP.
2 PALO ALTO SQUARE
3000 EL CAMINO REAL
PALO ALTO, CA 94306

| EXAMINER | |
|---|---|
| BOYER, RANDY | |

| ART UNIT | PAPER NUMBER |
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| 1797 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/716,839 | APPEL ET AL. | |
| | Examiner | Art Unit | |
| | Randy Boyer | 1797 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *05 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *21-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Examiner acknowledges response filed 5 October 2007 containing amendments to the claims and remarks.

2. Claims 21-36 are pending.

3. Claims 21, 22, and 24-26 are rejected under 35 U.S.C. 102(b).

4. Claims 23 and 27-36 are rejected under 35 U.S.C. 103(a). The rejections follow.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 21, 22, and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Baskis (US 5360553).

7. With respect to claim 21, Baskis discloses an apparatus for converting an organic liquor into a mixture of hydrocarbons, and carbon solids, comprising: (a) a heater (24) configured to receive and heat the organic liquor to produce a mixture of liquid and

vaporized oil; (b) a reactor (28) configured to receive and convert the mixture of liquid and vaporized oil into carbon solids and a mixture of hydrocarbon vapors and gases; (c) a first cooler (31) for accepting the carbon solids; and (d) a second cooler (19) for accepting the mixture of hydrocarbon vapors and gases.

8. With respect to claim 22, Baskis discloses wherein the reactor is an auger (column 6, lines 53-57).

9. With respect to claim 24, Baskis discloses wherein the first cooler (31) is an auger (column 3, 45-52).

10. With respect to claim 25, Baskis discloses wherein the apparatus further comprises a storage system (32) for accepting the carbon solids from the first cooler (31).

11. With respect to claim 26, Baskis discloses wherein the apparatus further comprises one or more preheaters (18) for heating the organic liquor prior to transferring the organic liquor to the heater (24).

### *Claim Rejections - 35 USC § 103*

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 23 and 29-36 are rejected under 103(a) as being unpatentable over Baskis (US 5360553).

16. With respect to claim 23, Baskis discloses an apparatus for converting an organic liquor into a mixture of hydrocarbons, and carbon solids, comprising: (a) a heater (24) configured to receive and heat the organic liquor to produce a mixture of liquid and vaporized oil; (b) a reactor (28) configured to receive and convert the mixture of liquid and vaporized oil into carbon solids and a mixture of hydrocarbon vapors and gases; (c) a first cooler (31) for accepting the carbon solids; and (d) a second cooler (19) for

accepting the mixture of hydrocarbon vapors and gases; wherein the heater comprises one or more tubes to promote efficient heat exchange (see Baskis, Fig. 1).

Baskis does not disclose wherein the heater comprises a vessel defining a chamber.

However, Baskis discloses wherein the heater is housed in a "vessel" (36, 22) which can be said to define a "chamber" (21). Thus, Examiner finds Applicant's limitations of a "vessel" and a "chamber" as components of the heater to be of no patentable consequence in view of the teachings of Baskis. Furthermore, Examiner notes that the mere rearrangement of parts of a prior art device generally cannot serve as the basis for patentability in the absence of unexpected results. See MPEP 2144.04(VI)(C). In this regard, Examiner submits that heating vessels defining a chamber and including one or more heat exchange tubes therein are well known in the art.

17. With respect to claim 29, Baskis discloses a second embodiment of his invention in which the organic liquor is preheated prior to entering the heating vessel by means of countercurrent flow of the organic liquor through a double pipe heat exchanger where steam is used as the heating fluid (see Baskis, column 6, lines 23-35). Likewise, Baskis provides for preheating of the organic liquor prior to entering the heating vessel in a first embodiment of his invention (see Baskis, column 3, lines 1-14).

18. With respect to claim 30, Baskis discloses wherein a second cooler comprises a carbon particulate separator (183).

19. With respect to claim 31, Baskis does not disclose wherein the apparatus further comprises a first system in communication with the second cooler and the reactor and configured to convey residual carbon solids from the second cooler to the reactor.

Nevertheless, Examiner submits that the person having ordinary skill in the art would have been motivated to modify the apparatus of Baskis to accomplish the same result, i.e. providing a recycle stream of carbon solids from the second cooler to the reactor in order to eliminate or reduce the amount of process waste requiring disposal.

20. With respect to claim 32, Baskis discloses an apparatus comprising: (a) a vessel (147) having an inlet and an outlet; (b) a first, heated auger (120) having an inlet (118) and an outlet (121), the inlet and outlet being configured and dimensioned to permit higher pressure to be applied in the first auger, the first auger inlet communicating with the vessel outlet; and (c) a first fluid-solid separator (128) communicating with the first auger outlet, the separator having a first outlet (176) for liquids and gases and a second outlet (175) for solids.

Baskis does not disclose an apparatus wherein the vessel is heated, or wherein the apparatus comprises a second auger communicating with the solids.

However, Baskis discloses wherein process liquid and material are heated upon exiting the vessel and before entering a first heated auger (see Baskis, column 6, lines 21-42). Thus, the disclosure of Baskis provides for the entry of a heated mixed process stream into a first heated auger – the same as for Applicant's invention. Moreover, Baskis discloses an auger (31) communicating with solids exiting a fluid-solid separator in a first embodiment of his invention.

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to modify the apparatus of Baskis to provide for a heated vessel and a second auger communicating with the solids exiting from a fluid-solid separator.

21. With respect to claim 33, Baskis discloses a condenser (177) communicating with the separator first outlet.

22. With respect to claim 34, Baskis discloses (in an alternative embodiment of his invention (see Baskis, Fig. 1)) a second separator (19) in communication with an outlet of a fluid solid separator (28) in which oil and gas is separated (see Baskis, column 4, lines 9-37).

23. With respect to claim 35, Baskis discloses wherein the apparatus further comprises a system (170, 171, 172, 174) in communication with an outlet of the first heated auger (120) and the vessel (147), the system (170, 171, 172, 174) configured to convey the gases to the heated vessel (147) (see Baskis, column 7, lines 17-39). In this regard, Examiner notes that the mere rearrangement of parts of a prior art device generally cannot serve as the basis for patentability in the absence of unexpected results. See MPEP 2144.04(VI)(C).

24. With respect to claim 36, Baskis discloses (in an alternative embodiment of his invention (see Baskis, Fig. 1)), a system (74, 34) in communication with an outlet (73) for fuel-gas and the heated vessel (28), the system (74, 34) configured to convey the fuel-gas to the heated vessel (28) (see Baskis, column 4, lines 38-52).

25. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baskis (US 5360553) in view of Lee (US 5466383). Alternatively, claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baskis (US 5360553) in view of Lee (US 5466383), as evidenced by Raymus (G. Raymus, "Handling of Bulk Solids and Packaging of Solids and Liquids", *in* PERRY'S CHEMICAL ENGINEERS' HANDBOOK, 7th ed. (1997), pp. 21-5 – 21-10).

26. With respect to claim 27, Baskis discloses an apparatus for converting an organic liquor into a mixture of hydrocarbons, and carbon solids, comprising: (a) a heater (24) configured to receive and heat the organic liquor to produce a mixture of liquid and vaporized oil; (b) a reactor (28) configured to receive and convert the mixture of liquid and vaporized oil into carbon solids and a mixture of hydrocarbon vapors and gases; (c) a first cooler (31) for accepting the carbon solids; and (d) a second cooler (19) for accepting the mixture of hydrocarbon vapors and gases.

Baskis does not disclose wherein the apparatus comprises an air lock between the reactor and the first cooler.

However, rotary air lock valves are well known in the art as a means of conveying dry process materials. *See generally*, Raymus, "Handling of Bulk Solids and Packaging of Solids and Liquids", *in* PERRY'S CHEMICAL ENGINEERS' HANDBOOK, 7th ed. (1997), pp. 21-5 – 21-10. In addition, Lee discloses a process and apparatus for treating dried sludge, wherein an air lock valve is used at the exit of an auger reactor so as to prevent the backflow of air into the reactor (see Lee, column 2, lines 39-45).

Therefore, the person having ordinary skill in the art of apparatuses for converting organic liquor into carbon solids and a mixture of hydrocarbons would have been motivated to modify the apparatus of Baskis to provide for use of air locks (e.g. such as those used by Lee) between the reactor and first cooler in order to (1) assist in the conveyance of carbon solids from the reactor, and (2) prevent the backflow of air from the cooler into the reactor.

Finally, the person having ordinary skill in the art of apparatuses for converting organic liquor into carbon solids and a mixture of hydrocarbons would have had a reasonable expectation of success in modifying the apparatus of Baskis as described above because (1) Baskis discloses the use of auger reactors; (2) it is well known in the art to use rotary locks as a means of conveying dry process materials (as evidenced by Raymus); and (3) Lee explicitly discloses the use of rotary locks in conjunction with auger-type reactors.

27. With respect to claim 28, Lee discloses the conveyance of dry process material through an air lock and into a storage system (see Lee, column 4, lines 66-67).

***Response to Arguments***

28. Applicant's arguments filed 5 October 2007 have been fully considered but they are not persuasive.

29. Examiner understands Applicant's principal arguments to be:

I. Baskis's heating unit of which container (28) is a part, cannot be deemed the equivalent of Applicant's heater and reactor because anticipation under 35

U.S.C. 102 must be found on an element-by-element basis.

II. Baskis's condenser column (19) is not a "cooler" in any manner understood by persons of ordinary skill in the art.

III. Baskis fails to teach or suggest a fluid-solid separator in communication with an outlet of the first auger.

30. With respect to Applicant's first argument, Examiner submits that Baskis discloses all elements of Applicant's claim 21 as that claim is currently amended. See discussion *supra* at paragraphs 6-11.

31. With respect to Applicant's second argument, Examiner notes that a gaseous mixture leaves the outlet pipe (29) of Baskis and enters the main condenser column (19) in which the temperature is regulated to cause oil and water to condense and separate from the more volatile gaseous components in the gaseous mixture (see Baskis, column 3, lines 64-68; and column 4, lines 9-15). Thus, Baskis's condenser column (19) is a "cooler" isasmuch as it effects a temperature change (i.e. a "cooling" or temperature drop) to such a degree as to cause water vapor present in the gaseous mixture to condense into liquid water.

32. With respect to Applicant's third argument, Baskis discloses a separator (128) that separates fluids (i.e. volatile gas and liquid in process line 176) from solids (in process line 175) (see Baskis, column 8, lines 47-57). Thus, Baskis clearly discloses a fluid-solid separator. Moreover, Examiner notes that Baskis further discloses a cyclone separator (172) (i.e. a second fluid-solid separator) in communication with an outlet of

the first auger (120) which separates heavy material and contaminants from steam (see Baskis, column 7, lines 17-23).

***Conclusion***

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 10:00 A.M. to 7:00 P.M. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB

Glenn Calderola
Supervisory Patent Examiner
Technology Center 1700